

NEW BRACHYURAN CRABS FROM THE GALAPAGOS ISLANDS

(PLATES 1-10)

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INTRODUCTORY REMARKS

By previous arrangement with Dr. Mary J. Rathbun, preliminary descriptions of three new species of oxystomatous crabs collected in the Galapagos Islands by Allan Hancock Expeditions prior to 1935 appeared in the Proceedings of the Biological Society of Washington, vol. 46, p. 183, (1933), and vol. 48, pp. 2-3, (1935), and were reviewed with figures in Bulletin 166 of the U. S. National Museum. In keeping with the policy of making expedition results immediately available, it has been thought advisable to publish the corresponding section of the nonoxystomatous crabs at this time, rather than to await the final report on the Hancock Brachyura.

Color notes given are according to Ridgway, *Color Standards and Color Nomenclature* (1912), and were made from living specimens at the time of capture by Mr. Anker Petersen, staff artist of the Allan Hancock Foundation, whose illustrations accompany this paper.

The writer wishes to acknowledge his indebtedness to Dr. Waldo L. Schmitt and Dr. Fenner A. Chace, Jr., for facilities placed at his disposal while consulting the collections of the U. S. National Museum and the Museum of Comparative Zoölogy, Harvard, during the summer of 1937, and to Dr. Mary J. Rathbun and Mr. Steve A. Glassell for helpful advice during the preparation of the manuscript.

MAJIDAE

Genus *ANOMALOTHIR* Miers
Anomalothir hoodensis, new species
Plate 1, Figs. 1-4

Type: Female, holotype, Cat. No. 381, and male, allotype, Allan Hancock Foundation, The University of Southern California, from north of Hood Island, Galapagos, Latitude 1°20' S., Longitude 89°40'

W., 140-160 fathoms; January 29, 1938; collected by Allan Hancock Expedition of 1938 at Station 817-38.

Measurements: Female holotype: length of carapace including rostrum 10.8 mm., width of carapace 5.6 mm., length of rostrum measured from level of preorbital spines 3.4 mm., width of rostrum at same level 1.5 mm., length of cheliped 12.6 mm., of first ambulatory 21.8 mm. Male allotype: length 9.6 mm., width 5.0 mm.

Diagnosis: Postorbital spine longer than preorbital. Third and fourth legs of approximately equal length. A single spine on the carpus of the cheliped. Merus of the third leg entire. Carapace little produced posteriorly; no tubercle in front of posterior margin.

Description: Carapace smooth and bare, regions faintly indicated. Cardiac area slightly more elevate than gastric when seen in profile. Rostrum curving gently downward, its length little more than twice its breadth measured from the bases of the preorbital spines; horns cleft to base but contiguous the greater part of their length, diverging slightly in their distal third and bearing a row of short setae on their outer margins. Basal article of antenna visible in dorsal view. Preorbital spine minute, postorbital spine prominent. Eyes large, eyestalks constricted at base of cornea. A few scattered spinules on hepatic and branchial areas. Posterior margin but little protruding; no spine or tubercle at posterior median angle.

Merus of cheliped armed with five stout spines beneath. Carpus with but one spine, superodistal. Manus moderately inflated in female; dactyl three fourths as long as propodus; fingers gaping in a broad oval at base. First ambulatory much the longest, over twice the length of the carapace, including rostrum; second ambulatory one and two-fifths times the length of the carapace; third and fourth legs shorter, subequal, the third being infinitesimally shorter than the fourth, its merus less robust. Dactyl of first ambulatory more than four fifths the length of the propodus; that of the second, three fourths the length of the propodus, dentate; dactyls of legs three and four little more than one half as long as of leg two, also dentate.

Antennae extending beyond the rostrum, basal article narrow, antennal spine minute. Antennular fossae large, incompletely divided, a notch at their bases. A prominent tubercle lateral to each green-gland opening. Several tiny spines on pterygostomian region. Merus of third maxilliped rounded at outer angle; ischium and merus spinulose along inner border, joints of palpus shortened, robust.

Color in life: Carapace clear pearly gray. Numerous orange-red dots along mid-line and continued on rostrum. Eye dark purplish red with green highlights; a few red dots on eyestalk. Merus of ambulatories banded with similar dots. Chela with faint tint of orange along upper surface. (Petersen)

Range: Eight specimens of the species, which was encountered by the 1938 expedition only, were dredged at Hood, Barrington, and Daphne Minor islands, Galapagos, in depths of from 20 to 160 fathoms.

Remarks: This species is the Pacific counterpart of the Atlantic species, *A. frontalis* (A. Milne Edwards) (1879), from which it may be distinguished by the equal lengths of the third and fourth legs, the single carpal spine, and the less produced posterior margin, which is devoid of a tubercle. Dr. Fenner A. Chace, Jr., has co-operated in the comparison of Hancock material with specimens in the Harvard Museum of Comparative Zoölogy.

Genus **PODOCHELA** Stimpson

Podocheila schmitti, new species

Plate 2, Figs. 1-4

Type: Male, holotype, Cat. No. 382, Allan Hancock Foundation, The University of Southern California, and one male and one female, paratypes, from north of Hood Island, Galapagos, 20-40 fathoms; January 28, 1938; collected by Allan Hancock Expedition of 1938 at Station 814-38.

Measurements: Male holotype: length of carapace including rostrum 12.8 mm., width of carapace 7.9 mm., length of rostrum 2.5 mm., of cheliped 14.6 mm., of first ambulatory leg 34.0 mm. Female paratype: length of carapace 12.3 mm., width 4.7 mm.

Diagnosis: Two prominent tubercles, one cardiac, one gastric; in front of the latter a lesser tubercle. Palms spinulous. Rostrum acuminate, typically bifurcate. First ambulatory of male two and one-half times length of carapace. Postorbital spine large, laciniate; hepatic spine cylindrical. Basal antennal article spinulous at outer distal angle.

Description: Carapace smooth, pyriform, elevations separated by shallow grooves of which the gastrocardiac seems to form a constriction about the body below the hepatic level. Two prominent setose tubercles or spines, one cardiac and one gastric; in front of the latter a smaller tubercle. Gastric region smooth, rounded, declivitous posteriorly, bearing

four tufts of curved setae arranged in a rectangle. Branchial regions flattened, a longitudinal row of curved setae traversing their entire length and a tuft of the same at inner angle. Hepatic region tumid, having the appearance of a mammary structure, and bearing a short, forward-directed, cylindrical, truncate spine. Pterygostomian ridge also provided with a similar, though smaller, spine at its mid-point. Rostrum thick and broadly triangular at base, transversely convex, nearly twice as long as broad, acuminate, the apex prolonged into a slender spine armed with two double rows of curved setae, the outer of which extend almost to the bifurcate tip. Orbits spinulose above, the largest spinule in some specimens becoming a minute preorbital spine. Post-orbital spine large, concave anteriorly, convex posteriorly, outer margin lacinate.

Basal antennal article narrowed anteriorly, a spine or cluster of spinules at external angle, bearing a thick, compressed, granular ridge which parallels the smooth inner, rather than the spinulose outer, margin. Antennae long, slender, provided with long yellow hairs which intercalate with those of the rostrum; second movable joint reaching tip of rostrum. Antennular fossae large, incompletely divided, their anterior margins granulate; interantennular septum bearing a prominent, berried tubercle. Merus of third maxilliped with inner angle produced into a thin, triangular blade, outer angle rounded; first joint of palpus moderately compressed. Segments of male sternum convex, deeply separated, two prominent tubercles at level of coxae of chelipeds. First abdominal segment bearing two median setose tubercles, the remaining segments one each, with the exception of the last, which has none.

Chelipeds of male robust, hairy, and spinulose. Merus trihedral, the curved lower margin armed distally with numerous spines, of which three or four are particularly conspicuous, and proximally with a fringe of hairs continued on the ischium. Carpus provided with two or three prominent tubercles, each bearing a cluster of spinules, of which the superproximal is outstanding in the type specimen. Palm inflated, roughened, a row of five or six spinules along its inner superior margin, another row of finer spinules along its inferior margin, and a transverse row across the palm; finer spinules of outer surface irregularly placed and interspersed with yellow hairs of varying lengths. Fingers gaping at basal half in a broad oval, broken by a prominent tooth on the movable finger, meeting in distal half, incurving; length of the movable finger equaling or exceeding length of palm.

First ambulatory leg longest, equal to two and one-half times the length of the carapace, including rostrum, its superior surface provided with groups of three curved setae evenly spaced, of which 34 may be counted from coxa to dactyl. Second ambulatory little more than half the length of the first, third and fourth ambulatory legs subequal in male type, although less mature male specimens show the fourth leg relatively shorter. Dactyls of first leg straight and approximately one third the length of penultimate segment, tip incurving; dactyls of legs two, three, and four falcate and from one half to two thirds the length of propodi, successively.

Female chelae slender, fingers almost meeting when closed, finely dentate, curving inward. First ambulatory twice the length of the carapace.

Color in life: Deep olive buff. (Petersen)

Range: The 16 specimens collected by *Velero III* were obtained from Hood, Chatham, Barrington, James, and the Daphne islands, Galapagos, in depths of from 20 to 80 fathoms.

Remarks: This species is readily separated from *P. margaritaria* Rathbun (1902), the other member of the genus common to the Galapagos, by the acuminate rostrum, that of *P. margaritaria* being hood-shaped. It is more nearly related to *P. hemphillii* Lockington (1877), from which it may be distinguished by the bifurcation of the rostral tip, the more prominent gastric and cardiac tubercles, the large, lacinate postorbital spine, the cylindrical tubercles of the mammilliform hepatic prominences, the presence of an anteroexternal spine or spinules on the basal antennal article, and the two median tubercles on the first abdominal segment.

I take pleasure in naming the species for Dr. Waldo L. Schmitt, Curator of Marine Invertebrates, U. S. National Museum, and member of three Allan Hancock Expeditions, whose untiring zeal, both in the field and in the laboratory, is a constant source of inspiration to those who work with him.

Genus **EUPLEURODON** Stimpson
Eupleurodon rathbunae, new species

Plate 3, Figs. 1-5

Type: Ovigerous female, holotype, Cat. No. 77366, U. S. National Museum, from a rocky spit at Gardner Bay, Hood Island, Galapagos;

January 25, 1933; collected by Allan Hancock Expedition of 1933 at Station 27-33.

Measurements: Female holotype: length of carapace including rostrum 7.1 mm., width of carapace 5.3 mm., length of rostrum 2.1 mm.

Diagnosis: Carapace foreshortened, wider between anterolateral than between posterolateral lobes. No preocular tooth. No small tooth on lateral margin between the two lobes. Distance between anterior lobes greater than distance from the tip of anterior lobe to middle of posterior border.

Description: Carapace pentagonal, depressed anteriorly and laterally, leaving a bold cardiogastric ridge and a cross ridge at the hepatic level. A single pair of tubercles on the gastric region, anterior to each a patch of strongly recurved hairs; a small tubercle near the posterolateral lobes and a cardiac one at a slightly posterior level. Lobes and tubercles clavately setose. Hepatic lobes strongly recurved, outer margins forwardly directed, subparallel, tips rounded; width of carapace at middle of anterior lobes greater than between posterior lobes and greater than the distance from the tip of the anterior lobe to the midpoint of the posterior margin of the carapace. Rostrum more than one third as long as the postfrontal portion of the carapace and with an average breadth of one half its length measured from the supraocular swelling, lateral margins raised near tip only, extremity faintly bilobed, lobes rounded, a slight median sulcus indicated.

Antennae almost reaching tip of rostrum. Antennular cavity reaching middle of rostrum, not nearly filled with antennules, and very incompletely divided into two fossae. Merus of outer maxilliped notched at anterointernal angle to receive palpus, first article of palp enlarged and flattened, last two articles small and cylindrical, hidden behind merus.

Cheliped with visible portion of merus and carpus nodose, merus with a lump on superior margin one third from base, carpus with a prominent inner node and one or more superior nodules; propodal finger deflexed, dentate, teeth more numerous and more prominent than those of the movable finger, of which but three or four may be counted.

First ambulatory leg exceeding cheliped in length, its dactyl as long as the propodus. Dactyls of remaining legs shorter, strongly falcate, finely dentate, digital tooth of propodus strong, blunt, and with a hairy tip.

Abdomen of female with three tubercles on first segment.

Remarks: This species may be distinguished from *Eupleurodon trifurcatus* Stimpson (1871) by the absence of a small tooth between the two lateral lobes, and from *E. peruvianus* Rathbun (1924) by the greater proportionate anterolateral width as compared with the posterolateral, the less prominently notched front, and the absence of additional tubercles on the gastric and branchial regions. It bears a superficial resemblance to *Epialtus peruvianus* Rathbun (1923) which is not borne out by careful measurement, for the distance from tip to tip of the hepatic lobes is considerably greater than the distance from the tip of the hepatic to the middle of the posterior margin of the carapace, instead of equidistant, if we judge from Rathbun's figure 53i (1925). Because of the depressed carapace, the forward-directed hepatic teeth, and the dentigerous penultimate articles, the species under consideration falls logically into the genus *Eupleurodon* Stimpson rather than *Epialtus* Milne Edwards.

This interesting little crab is named for Dr. Mary J. Rathbun, Associate in Zoology, U. S. National Museum, whose counsel has been invaluable in the preparation of this paper.

XANTHIDAE

Genus **GLYPTOXANTHUS** A. Milne Edwards

Glyptoxanthus hancocki, new species

Plate 4, Fig. 1; Plate 5, Figs. 1a, 2a, 3a

Type: Female, holotype, Cat. No. 383, Allan Hancock Foundation, The University of Southern California, and male, allotype, from Sullivan Bay, James Island, Galapagos, shore; January 21, 1938; six females, paratypes, same locality and date; collected by Allan Hancock Expedition of 1938 at Station 796-38.

Measurements: Female holotype: length of carapace 18.3 mm., width 25.9 mm. Largest specimen (female, asymmetrical): length 25.8 mm., width 38.0 mm. Male allotype: length 18.6 mm., width 26.9 mm.

Diagnosis: Elevations sparsely pitted, 3M (of Dana) having but two punctae, both median. Gastric areole independent of inner proto-gastric. Front separated from rest of carapace by a transverse furrow joining orbits. 5L raised above general level of carapace. Teeth projecting but little beyond arc of anterolateral margin.

Description: Carapace, chelipeds, and ambulatories covered dorsally with a labyrinth of smooth, elevated ridges separated by deep furrows bordered with a fine pile. Punctae few in number as compared with other members of the genus, 3M having but two, both median, and the cardiac areole also but two, transversely placed. 3M continued forward as a long median spike, not confluent laterally with the inner protogastric ridge. Outer protogastric areole independent of inner, 2L and 3L separated. Front deflexed, the thickened lobes separated from the adjacent posterior areole by a continuous furrow which communicates with the orbital hiatus. 5L slightly higher than the rest of the carapace. Teeth N,T (of Dana) not projecting beyond the arc of the anterolateral border, E,S but slightly projecting. Male abdomen constricted between segments 5 and 6, the transverse ridges of the central portions parallel and not joined to the corresponding prominences on the lateral margins of the abdomen.

Chelae subequal, the tubercles of the hand mammilliform, their bases not tending to coalesce. Fingers of both claws strongly grooved, the four or five large teeth fitting closely together, the movable finger smooth at base. Both ischium and merus of the third maxilliped moderately furrowed, merus strongly notched for insertion of palpus. Dactyls of ambulatories granulate, densely wooly.

Color in life: Dark areas on carapace a rich violet carmine, a little more reddish on branchial and posterior areas. Light areas cadmium orange on frontal, gastric, and cardiac regions; branchial and intestinal regions same color but lighter in tone. Chela violet carmine on dark areas; fingers very dark seal brown, fading toward tips, which are almost white. Ambulatory legs burnt lake on dark areas and light cadmium orange on light areas. Nail of dactyl amber. Eyestalk pale orange-yellow; eye blackish brown. (Petersen)

Range: The 21 specimens secured by *Velero III* collectors were from Charles, Albemarle, James, South Seymour, and Tower islands, Galapagos, under rocks at low tide.

Remarks: While at the Museum of Comparative Zoölogy at Cambridge in the summer of 1937 the writer was afforded the opportunity of examining, through the courtesy of Dr. Fenner A. Chace, Jr., a specimen of *Glyptoxanthus labyrinthicus* (Stimpson) (1860) male, type (M.C.Z. 1295) and of comparing with it Hancock material taken in the Galapagos Islands. Additional specimens collected in Panama by Dr. Maack (M.C.Z. 2218) and S. W. Garman (M.C.Z. 2306) and

identified by W. Faxon as *labyrinthicus* were also examined, as well as a female specimen (M.C.Z. 2219) taken in the Galapagos in June, 1872, by the *Hassler*, of which Rathbun (1930) notes: "slight variation."

The 20 specimens of *Glyptoxanthus* taken at 10 stations of *Velero III* in the Galapagos from 1933 to 1938 inclusive conform to the *Hassler* specimen as regularly as do the Panamanian specimens to the type of *labyrinthicus*, and may be distinguished from the mainland species by a number of distinct features, which are clearly set forth in the diagnosis above. The removal from synonymy of Lockington's *G. meandricus* (1877) by the finding by Glassell of a valid species in the Gulf of California to which the name is applicable shows that the genus may well be represented in Pacific waters, as in the Atlantic, by several species, one of which, according to the evidence now at hand, is indigenous to the Galapagos Archipelago and is herewith described. For comparative studies of carapace designs, fronts, claws, and male abdomens of typical specimens of *G. hancocki* from James Island, Galapagos, *G. labyrinthicus* from Port Utria, Colombia, and *G. meandricus* from Puerto Refugio, Angel de la Guardia Island, Gulf of California, Mexico, see plates 4 and 5.

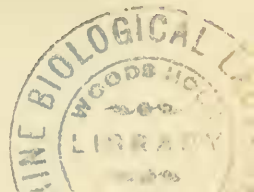
I take pleasure in naming this species for Captain Allan Hancock, who has given me the unparalleled opportunity of studying the Galapagos crustacean fauna at first hand on five separate occasions.

Genus **HEXAPANOPEUS** Rathbun

Hexapanopeus cartagoensis, new species

Plate 6, Figs. 1-4

Type: Male, holotype, Cat. No. 384, Allan Hancock Foundation, The University of Southern California, from Cartago Bay, Albemarle Island, Galapagos, 15-18 fathoms; January 22, 1938; collected by Allan Hancock Expedition of 1938 at Station 799-38. Ovigerous female, allotype, Cat. No. 384a, Allan Hancock Foundation, and two females, of which one is ovigerous, paratypes, same locality, 3-6 fathoms; February 14, 1933; dredged by Allan Hancock Expedition of 1933 at Station 74-33. Three males and seven females, of which four are ovigerous, paratypes, same locality, 8-10 fathoms; January 25, 1934; collected by Allan Hancock Expedition of 1934 at Station 187-34.



Measurements: Male holotype: greatest length of carapace 5.4 mm., greatest width 7.3 mm., length of major chela 6.4 mm. Female allotype: length 3.9 mm., width 5.4 mm.

Diagnosis: Front oblique, lateral lobes prominent. Second anterolateral tooth low and fused with first, their combined width little greater than that of third tooth. Fourth tooth laterally directed, tip tuberculiform. Fifth tooth reduced, almost postlateral in position. Major chela of adult male without superior crest.

Description: Regions of dorsal surface of carapace separated by conspicuous furrows and bearing elevate, transverse ridges. Front advanced, edges thickened, granulate, oblique, a shallow V meeting the median epigastric groove, a prominent lobe at the outer extremities. Inner supraorbital tooth distinctly separated from frontal lobes; space between closed fissures of orbit low and broad, scarcely attaining the level of the outer orbital tooth, which is narrow at base, acute at tip, and outwardly directed. Second anterolateral tooth obsolescent, fused with the first, the two together occupying little more than the width of the third. Third tooth largest, its anterior margin transverse and bearing a suggestion of a denticle at its base, the outer margin straight and posteriorly directed except at base, where it bends sharply inward. Fourth tooth tuberculiform at tip and laterally directed, its anterior margin shorter than the posterior; carapace widest at this point. Fifth tooth reduced and almost postlateral in position, although not so much as in *H. caribbaeus*, and also laterally directed. Posterolateral margins strongly converging. Principal elevations of the carapace bearing sparse hairs and located, in the order of their prominence, as follows: mesobranchial, cardiac, metabranchial, protogastric, mesogastric, and epibranchial.

Chelipeds dissimilar but of nearly equal proportions, the larger strongly inflated, smooth under low magnification, and without the superior crest common in the genus. Carpus also smooth and bare, except for a prominent spine at anterointernal angle, a lump toward the distal end, and a faint outer furrow. Minor chela more compressed than major, its carpus similar. Color of fingers dark brown with white tips; color of fixed finger of major claw terminating abruptly a very little behind the interdigital sinus, that of minor claw extending farther on the hand. Movable finger with a large basal tooth and strongly curved downward to meet the upturned tip of the fixed finger. Movable finger of minor chela long, curved, and slender. The fixed finger of this claw is missing in the type specimen.

Male abdomen with basal segment occupying entire width of sternum, second segment little more than half the width of first, third segment again wider; abdomen narrowing to base of sixth segment, which is broader than long; tip of seventh segment rounded.

In the female allotype the front is more truncate than in the male holotype, the lateral lobes less advanced. The chelae, particularly the major, are less inflated and show a granulate superior crest with a well-defined sulcus.

Remarks: This species may be distinguished from *H. caribbaeus* (Stimpson) (1871) by the independent fifth lateral tooth, which is decidedly more than "a section from the posterior slope of the fourth" (Rathbun); from *H. sinaloensis* Rathbun (1930) by the oblique front with lateral lobes, the front of *sinaloensis* being truncate and lobeless; from *H. orcutti* Rathbun (1930) by the reduction of the second tooth, the less granular appearance of the elevations of the carapace and chelipeds; and from all three by the lack of a superior furrow on the large claw of the adult male. Examination of paratypes of *H. setipalpus* Finnegan (1931), kindly loaned by Dr. Isabella Gordon of the British Museum, shows the second lateral tooth almost equally advanced with the first instead of obsolescent, the conspicuous hairy palpus as long as the combined merus and ischium of the outer maxilliped instead of half their length, and the strong tooth of the manus located on the pollex instead of on the dactyl, as shown by figure 2 of plate 6.

Genus **KRAUSSIA** Dana

Kraussia americana, new species

Plate 7, Figs. 1-4

Type: Male, holotype, Cat. No. 371, Allan Hancock Foundation, The University of Southern California, from Puerto Refugio, Angel de la Guardia Island, Gulf of California, Mexico, 8-10 fathoms; March 20, 1937; one male, paratype, same locality and date; collected by Allan Hancock Expedition of 1937 at stations 705-37 and 706-37, respectively.

Measurements: Male holotype: length of carapace 10.9 mm., width 14.7 mm., of front 6.3 mm., length of chela along superior border 8.3 mm., of manus 5.0 mm., of movable finger 6.3 mm., of immovable finger 3.7 mm., height of gape 2.3 mm.

Diagnosis: Front bilobed, subtruncate; lobes arched. Carapace one and one-third times as broad as long. Anterolateral margin greatly exceeding posterolateral margin. Orbits reduced to slits dorsally; eyes small. Fingers of nearly equal length, gaping in a broad oval. First segment of palpus of third maxilliped inflated and horizontally compressed. Margins of carapace and legs fringed with long, cylindrical, golden hairs.

Description: Carapace broadly oval, one and one-third times as wide as long, strongly convex fore and aft, and smooth and bare to the naked eye, except toward posterior lateral angles, which are traversed by granular ridges. Surface dotted with scattered transverse punctae, more numerous on the frontal and lateral portions of the carapace, which bear clusters of short, forward-pointing, yellow hairs arising from their granulate posterior margins. Granulation becoming more prominent toward lateral margins, where are also found granules not associated with pits. Anterolateral margin greatly exceeding posterolateral, forming an unbroken arc spiked with sharp granules and fringed with long, straight, cylindrical, yellow hairs. Front bilobed, edge granulate, projecting, lobes arched and separated by a deep and narrow median V from which a furrow extends to the gastric region, which is faintly indicated. Orbits poorly developed dorsally, there being but an acute, angular notch through which a minute black eye is visible. Eyestalks subsessile, spinulous distally. Basal antennal article small, posteriorly placed but touching front, and clearly separating antennular pits from orbit, flagellum projecting beyond front for less than half its length. Antennules folding obliquely. External maxilliped fringed with long, fine, yellow hairs, merus rhomboidal, outer angle rounded, inner angle produced, first joint of palpus inflated and horizontally flattened, approximately one fourth as large as merus.

Chelipeds equal in size. Carpus squarish with spinulous inner and distal margins, and a distal fringe of yellow hairs. Manus compressed at dorsal point of articulation with the carpus, in advance of which the crest of the palm rises abruptly, surmounted by two rows of six or seven spinules each, between which grow more yellow hairs. Palms superficially smooth but microscopically granulate, bearing clusters of yellow setae arranged in several rows. Color of fingers dark brown, that of immovable finger continued a short distance on the palm, color fading to white at tips. Fingers strongly curved, meeting at tips, leaving an oval gape more than half as high as long. Each finger provided with

a pair of brushes of curved golden hairs arising from both inner and outer surfaces at equal distances from the tips. Gordon (1934) illustrates a remarkably similar contrivance for *Phymodius laysani*.

Ambulatory legs compressed laterally, fringed with long hairs anteriorly and short hairs posteriorly. Merus with a few scattered spinules above; carpus high, overlapping base of propodus above, crenulate along superior margin, spinulous distally; propodus of last two legs shield-shaped, a cluster of blunt spinules above; dactylus bladelike, triangular in cross section, armed with a double row of spinules, of which one row of six is most prominent, tips straight, horny, yellow.

Male abdomen seven-jointed, segments 3-4-5 fused. First three segments visible in dorsal view.

Range: Nine specimens were obtained by Allan Hancock Expeditions from Hood, Charles, Barrington, Albemarle, and James islands, Galapagos; 30 from Puerto Refugio, Angel de la Guardia Island, to Los Frailes, Gulf of California, Mexico; and one specimen from Secas Islands, Panama; depths from 4 to 40 fathoms. Three additional specimens taken in Banderas Bay, Mexico, by the *Stranger* expedition of 1937, led by Capt. Fred E. Lewis, in 5-10 fathoms, are in the collection of Mr. S. A. Glassell.

Remarks: This species has been confused by several carcinologists with *Acidops fimbriatus* Stimpson (1871), a *Pilumnus*-like species also white in color and with long, shaggy hair. However, the very long eye-stalks of *Acidops* and its distinctly dentate anterolateral margin are but two of many prominent characters separating it from the species under consideration.

The American form appears to be distinguished from the previously described species of *Kraussia* Dana (1852) by the small eye and much reduced orbits, as well as the long, gaping fingers. It perhaps most nearly approaches *K. intiger* (de Haan) Alcock (1899) which can be easily recognized by the very much reduced finger of the cheliped, described as little better than a tubercle.

Because of the minute size of the Galapagos specimens, the type is selected from the Gulf of California series.

I am indebted to Dr. Fenner A. Chace, Jr., of the Museum of Comparative Zoölogy, Harvard, for a diligent search of the scattered literature on this Old World and Mid-Pacific genus, of which the first American species is here presented.

Genus **MALDIVIA** Borradaile
Maldivia galapagensis, new species

Plate 8, Figs. 1-6

Type: Male, holotype, Cat. No. 385, and ovigerous female, allotype, Allan Hancock Foundation, The University of Southern California, from *Pavonia* coral taken inside submerged crater of Onslow Island, near Charles Island, Galapagos, 2 fathoms; January 23, 1938; one male and five females, paratypes, same locality and date; collected by Allan Hancock Expedition of 1938 at Station 804-38.

Measurements: Male holotype: length of carapace 3.7 mm., width 4.6 mm., length of major chela 4.9 mm., height 2.4 mm., fronto-orbital width 3.3 mm. Female allotype: length 3.9 mm., width 5.5 mm.

Diagnosis: Two denticles on anterolateral margin; posterolateral borders exceeding anterolateral. Granules of cheliped flattened, not arranged in rows; fixed finger of major claw not constricted at base. Minor chela excavate, slender. Merus of third maxilliped subquadrate.

Description: Carapace broader than long, slightly convex, polished, faintly granulate anteriorly, regions not indicated, a few fine hairs showing in the region of the front and about the anterolateral borders. Body finely pocked with magenta dots which tend to fade out in alcohol. Two denticles on the anterolateral margin besides the postorbital; a suggestion of a third on the male type considerably farther back. If from this point measurement is made, the strongly converging posterolateral margins are found to exceed the anterolateral. Front broad, slightly deflexed, but faintly divided into lobes, a single or a double transverse row of granules behind it on some specimens. Orbital margins entire. Eyes large, peduncles stout, constricted below cornea. Base of antenna narrow, second movable joint reaching front, antenna not excluded from orbit, flagellum as long as half the front. Efferent ridge strong. Merus of outer maxillipeds considerably broader than long, subquadrate, outer angle rounded, inner angle slightly notched to receive palpus.

Chelipeds grossly disproportionate, the larger turgid, outer surface rough and slightly pubescent. Merus stout and smooth, carpus finely granulate, the granules increasing in size toward the outer distal margin, which is covered in some specimens with a fine pile. Major chela inflated, the lower half of the outer surface bare and microscopically granulate, the granules increasing in size toward the upper margin. Minor chela excavate, about half as high as major, similarly roughened, the

granules becoming acuminate above. Dactyls of the large manus roughened at base, immovable finger strongly toothed, fingers closing with a slight gape, the tips crossing; no teeth on movable finger. Fingers of small hand long, narrow, thin, curved, the knifelike edges meeting their entire length, a single row of setae lining the inner surface of each; tips fine, curved, and overlapping.

Ambulatory legs narrow, laterally compressed, the last three segments sparsely hairy. Dactyls incurving, provided with a proximal projection which neatly overrides a corresponding flange of the propodus, and fringed with plumose hairs.

Color in life: Ground color of carapace ivory yellow to cream buff; posterolateral, branchial, and cardiac areas ivory yellow; gastric and frontal regions cream buff with cadmium orange hue, slightly darker on frontal area. A border of clear jasper pink on front, around eye and marginal teeth, fading out on anterolateral margin. This color appears also on intestinal region, but a shade darker. Designs on carapace Eugenia red and grass green on posterior and Brazil red and cedar green on anterior areas. Eystalk cadmium orange, eye dark garnet brown. Cheliped clear creamy white with coral red on merus and carpus. Small granules on hand Indian lake, large tubercles coral pink, lighter on outer surface with yellowish hue, band on distal end spinel red. Fingers hazel brown at base, becoming lighter toward tip. Ventral side clear white with tinge of bluish lavender. (Petersen)

Range: The 24 specimens in the Hancock collections are from Onslow Island, near Charles Island, and Barrington Island, Galapagos. All were cracked from *Pavonia* coral.

Remarks: The above species is closely allied to *M. gardineri* Rathbun (1911) from which it differs in the following particulars, as shown by a comparison with the type:

(1) Anterolateral denticles less prominent, the second, exclusive of the postorbital, but faintly indicated.

(2) The sharpened, white granules which are so conspicuous on the outer portion of both chelae and at the base of the movable fingers of each hand in *gardineri* are reduced to a flattened paving of granules of the same color as the background, although slightly sharpened on the minor chela, and are not arranged in rows.

(3) Immobile finger of major manus not constricted at base, a feature not mentioned in the description of *gardineri* but discovered by examination of type.

(4) The unusual minor chela similar, but longer than in *gardineri*; in this respect both differ from *M. symbiotica* Borradaile (1903), the type of the genus, the chelae of which are alike.

PINNOTHERIDAE

Genus PARAPINNIXA Holmes

Parapinnixa glasselli, new species

Plate 9, Figs. 1-4

Type: Female, holotype, Cat. No. 77367, U. S. National Museum, and female, paratype, from "roach" trap, Tagus Cove, Albemarle Island, Galapagos; February 9, 1933; collected by Allan Hancock Expedition of 1933 at Station 66a-33.

Measurements: Female holotype: length of carapace 2.8 mm., width 6.5 mm.

Diagnosis: Displacement of first ambulatory leg equal to nearly one-half volume of carapace. Fingers long and slender, gaping when closed, a small tooth near tips. Immobile finger curving well downward. Lines separating abdominal segments sinuous.

Description: Carapace bare and glistening, 2.3 times as broad as long, anterior and posterior margins subparallel. Front depressed, lobes oblique, a groove behind margin, median furrow not reaching edge of front. Due to configuration of front, the eyes appear anterior to it. Orbits almost circular in shape, orbital hiatus occupied by the minute basal antennal article. Antennules folding obliquely. Buccal area an isosceles triangle with the broad base concealed by the first sternal plate. Ischium of third maxilliped rudimentary, merus broadly triangular, exterior margin finely crenulate and bordered with plumose hairs, first segment of three-jointed palpus with outer margin rounded and bearing similar hairs.

Chelipeds powerful, contours smooth and evenly rounded, carpus and palm of approximately equal width, fingers long and slender, gaping, prehensile edges with a small tooth near tips, immobile finger curved well downward, dactyl a little longer than upper edge of palm.

First ambulatory leg greatly enlarged, its displacement equal to nearly one half the volume of the carapace, merus deeply excavated to receive cheliped, widening distally, carpus swollen tremendously, nearly as wide as long, propodus narrowing distally, dactylus long and slender.

Second and third ambulatories of normal size, propodites fringed with two rows of natatory hairs. Fourth leg reduced in size, its length when extended falling considerably short of the distal end of the merus of the third, its dactyl a mere tooth.

Abdomen seven-segmented, the third and fourth segments widest and of approximately equal breadth; lines between segments sinuous; seventh segment broader than long, tip rounded, resembling *P. asiatica* Sakai (1933).

Remarks: This species is near *P. nitida* (Lockington) (1877), but differs in the longer and narrower fingers, the gape of the fingers when closed, the downward curvature of the immovable finger, the greater size of the first ambulatory, and the longer and more slender dactyls of the first three ambulatory legs. The measurements of the holotype are identical with those of a half-grown female of *P. nitida* in the collection of S. A. Glassell.

The capture of two female specimens in a baited "roach" trap attached to a lobster pot and suspended in several fathoms of water suggests that the species, while undoubtedly commensal, does not hesitate to fare forth from its worm tube in search of food.

I take great pleasure in naming this species for Mr. Steve A. Glassell, whose unflagging interest in the unusual habits of these little crabs and whose persistent efforts in searching out a number of so-called "lost" species have resulted in our better understanding of their relationships and peculiar mode of life.

CYMOPOLIIDAE

Genus CYMOPOLIA Roux

Cymopolia velerae, new species

Plate 10, Figs. 1-4

Type: Ovigerous female, holotype, Cat. No. 386, Allan Hancock Foundation, The University of Southern California, from off Daphne Island, Galapagos, 70-80 fathoms; January 20, 1938; two males and fifteen females, paratypes, same locality and date; collected by Allan Hancock Expedition of 1938 at Station 792-38.

Measurements: Female holotype: greatest length of carapace 6.9 mm., width 9.9 mm., length of second leg 14.3 mm. Largest male paratype: length 4.1 mm., width 4.9 mm.

Diagnosis: Abdomen with laminate crests visible in dorsal view. Five anterolateral teeth diminishing rapidly in size posteriorly. Outer suborbital lobe trilobed, inner sinus narrow. Outer slope of frontal lobe continuous with preorbital lobe. Supraorbital teeth broad, truncate. Merus of leg two with distal spine acuminate. Carapace 1.4 times wider than long; a sinuous posterior line of tubercles.

Description: Carapace considerably broader than long, depressed and uneven; tubercles distinct, well separated, and tending to form transverse ridges, especially on the cardiac region. Median pair of frontal lobes moderately slender, compressed, acutely rounded, and separated by a deep fissure the size and shape of one of the teeth inverted; the outer two broad, little advanced, and separated from the median pair by a shallow U. The sloping front forms a continuous, though sinuous, line with the broad preorbital lobe which covers the eyestalk. Middle supraorbital lobe granular, broadly truncate, separated from the inner lobe by a deep, inwardly directed V-fissure and from the outer lobe by a similar fissure less inwardly directed and half the depth. Outer orbital lobe slightly more advanced than middle lobe, and not separated from the large, blunt, and forwardly directed exorbital tooth. Anterolateral teeth five in number, excluding the exorbital, small and well separated; the first half the size of the exorbital, the second half the size of the first, the remainder diminishing rapidly to the fifth, which again is larger than the fourth, lobate, and at the lateral angle. Outer slope of each tooth obtusely bent from outwardly directed at base to inwardly directed near apex. Tubercles of carapace located as follows: the four largest form an arc with a wide radius across the cardiac region; four smaller tubercles form an arc of smaller radius across each mesobranchial region; a single tubercle occurs on each epibranchial and on each hepatic region; two are located behind the front; nine occur on the gastric region, of which two are epigastric; four at the level of the first anterolateral tooth, a single median one just posterior to them, and two opposite the third anterolateral tooth; a single median intestinal tubercle, and a sinuous line of finer tubercles immediately above the posterior margin.

Lower margin of orbit oblique, divided by a narrow V-shaped sinus into two lobes, the outer trilobed, granulate, the inner rounded, advanced, its base hidden by the broadly lobate pterygostomial process. Merus of maxilliped with outer angle much produced, inner angle less so.

Chelipeds feeble, equal in size, and similar in sexes. Granules of outer surface of hand chiefly in two rows.

First leg short and slender, its dactyl reaching but little beyond the carpus of the second, merus rough, bearing an acute tooth at its distal extremity. Second leg longest, 1.4 times the width of the body, its merus robust, cristate, and bearing a large, acutely angled, acuminate spine distally. Third leg similar to second, its merus slightly shorter and two thirds the width of the second, the distal meral spine rectangular. Carpus of legs two and three long and narrow, proximal lobes less produced than distal; propodus widening distally; dactylus of leg two with posterior margin almost straight, of leg three more noticeably sinuous.

First three segments of female abdomen carinate, the first carina having a shallow lobe behind each corner of the carapace, the second forming a median lobe, the third projecting both laterally and medially. A prominent sternal plate visible in dorsal view at base of third walking leg.

Range: The 106 specimens at hand come from Hood, Chatham, Indefatigable, Albemarle, James, South Seymour, Daphne Minor islands, and pelagic stations, Galapagos, in depths of from 3 to 150 fathoms.

Remarks: A small species, more closely related to *C. sica* A. Milne Edwards (1880) than to any of the known Pacific forms because of the laminate crests of the abdomen, the configuration of the frontal and orbital teeth, and the peculiar sternal plate at the base of the third walking leg. Not to be confused with *C. zaca*e Glassell (1936), although the number and arrangement of the anterolateral spines are similar. The proportion of the breadth to the length of the carapace, and of the length of the ambulatories to the width of the body, will suffice clearly to distinguish these two.

This species is christened *velerae* in honor of the Allan Hancock Expedition cruiser, *Velero III*, whose name is a byword in every bay from San Diego to Southern Peru, as well as in the Galapagos Islands.

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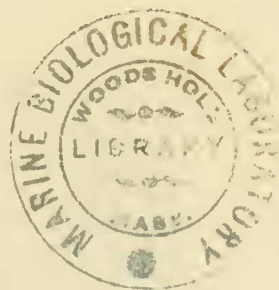


PLATE 1

Anomalothir hoodensis, new species
Female holotype

- Fig. 1. Dorsal view
- Fig. 2. Lateral view of carapace
- Fig. 3. Ventral view of front
- Fig. 4. Left outer maxilliped

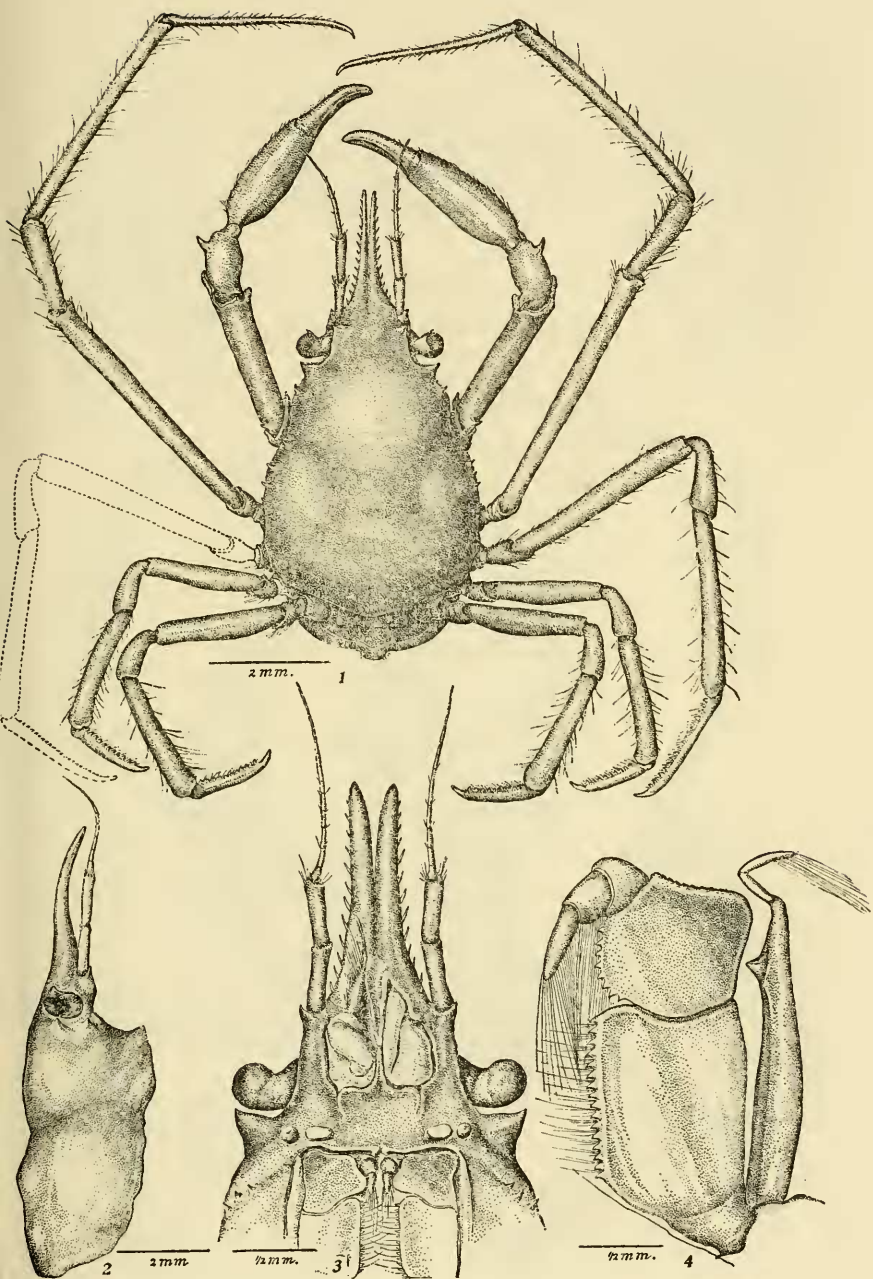


PLATE 2

Podochela schmitti, new species
Male holotype

- Fig. 1. Dorsal view
- Fig. 2. Ventral view of front
- Fig. 3. Right chela
- Fig. 4. Left outer maxilliped

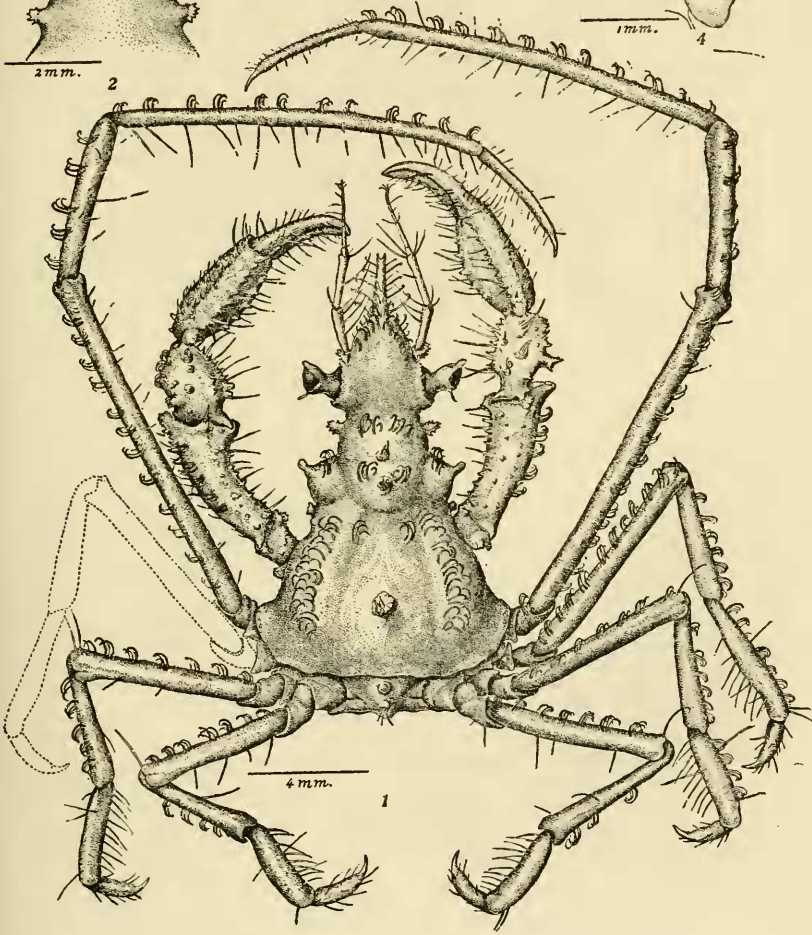
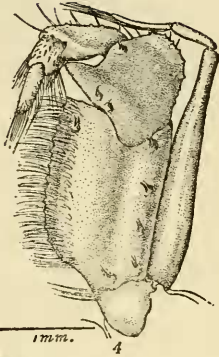
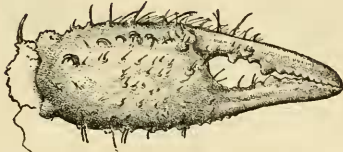
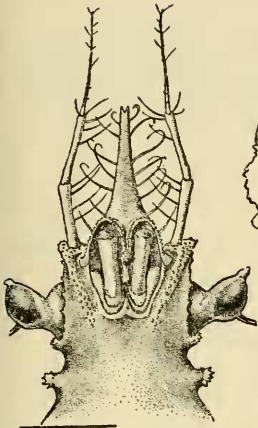


PLATE 3

Eupleurodon rathbunae, new species
Female holotype

- Fig. 1. Dorsal view
- Fig. 2. Right cheliped
- Fig. 3. Left fourth ambulatory leg
- Fig. 4. Right outer maxilliped
- Fig. 5. Ventral view of front

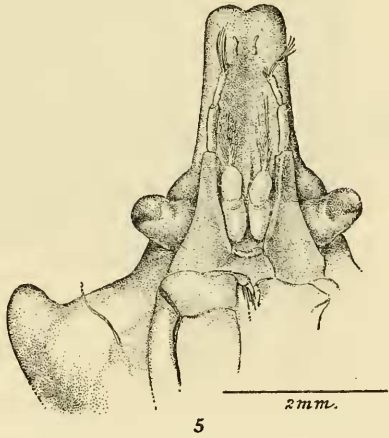
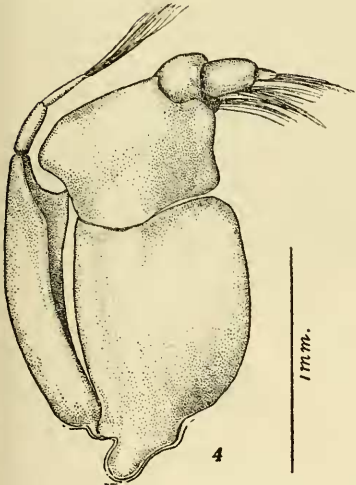
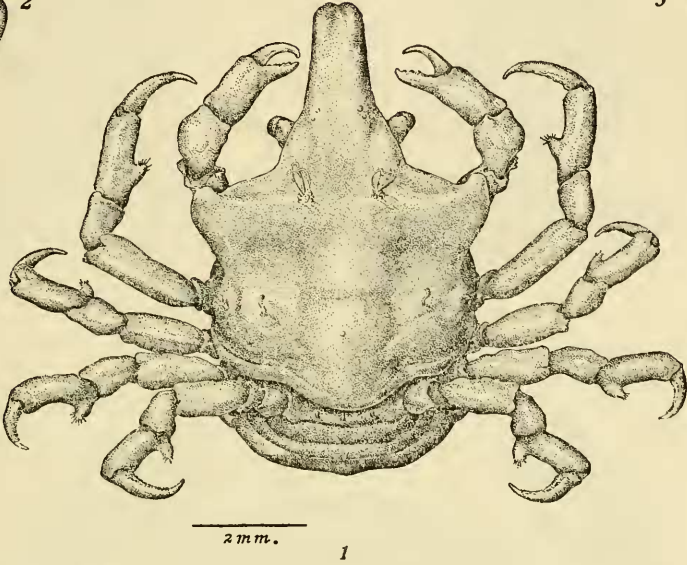
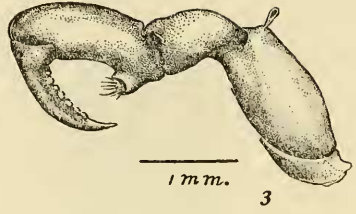
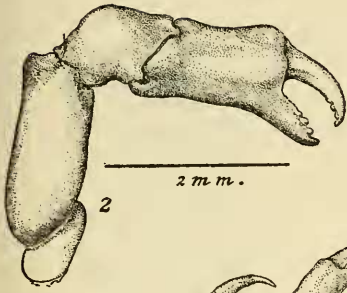
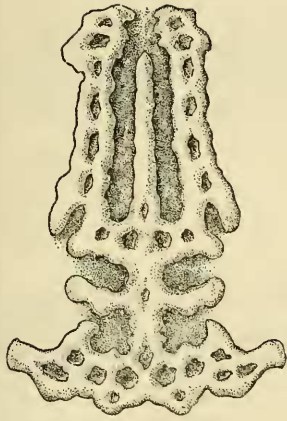


PLATE 4

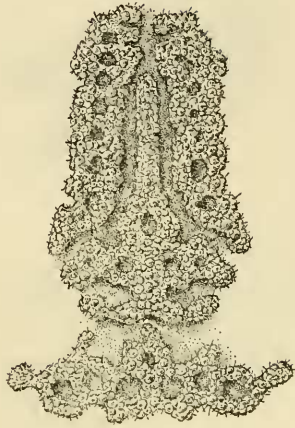
Glyptoxanthus species

- Fig. 1. *Glyptoxanthus hancocki*, new species
Female holotype, dorsal view
- Fig. 2. *Glyptoxanthus labyrinthicus* (Stimpson)
Gastrocardiac region
- Fig. 3. *Glyptoxanthus meandricus* (Lockington)
Gastrocardiac region



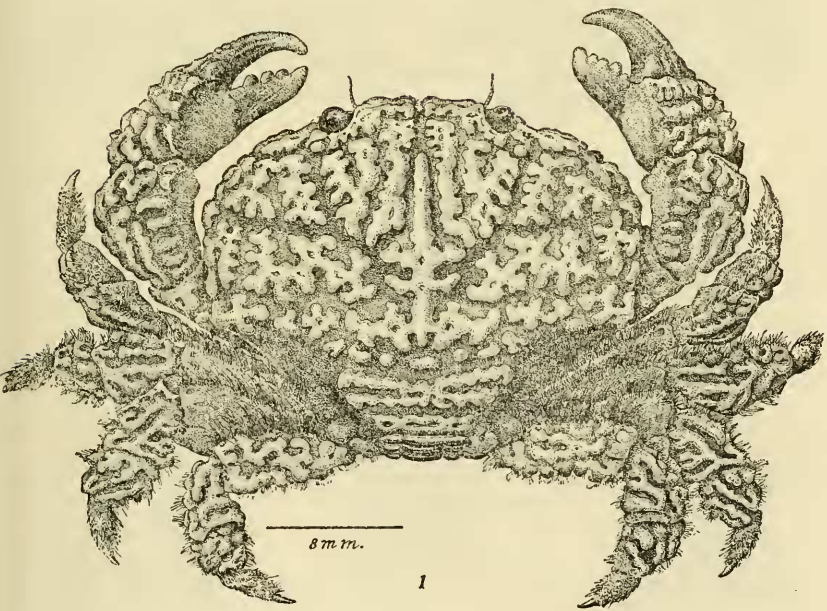
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2



6 m. m.

3



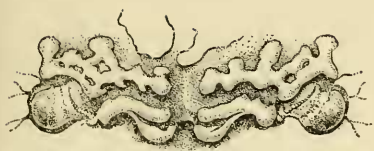
8 m. m.

1

PLATE 5

Glyptoxanthus species

- Fig. 1. Comparative studies of fronts ♂
a. *Glyptoxanthus hancocki*, new species, allotype
b. *Glyptoxanthus labyrinthicus* (Stimpson)
c. *Glyptoxanthus meandricus* (Lockington)
- Fig. 2. Comparative studies of chelae ♂
a. *Glyptoxanthus hancocki*, new species, allotype
b. *Glyptoxanthus labyrinthicus* (Stimpson)
c. *Glyptoxanthus meandricus* (Lockington)
- Fig. 3. Comparative studies of abdomens ♂
a. *Glyptoxanthus hancocki*, new species, allotype
b. *Glyptoxanthus labyrinthicus* (Stimpson)
c. *Glyptoxanthus meandricus* (Lockington)



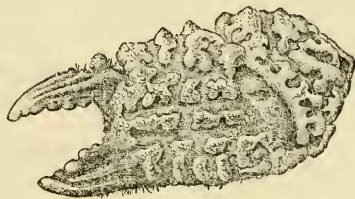
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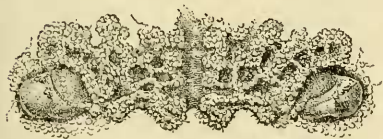
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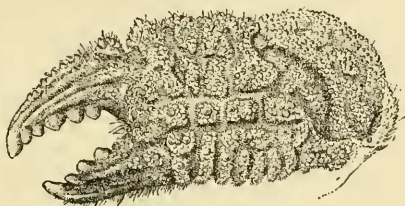
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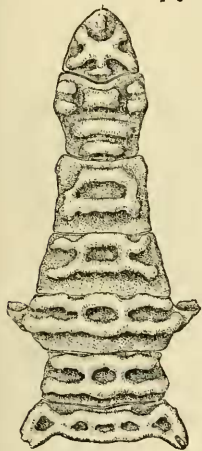
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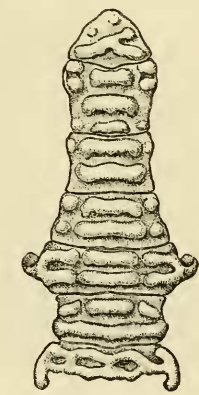
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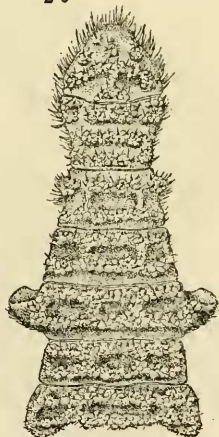
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3 b



3 a

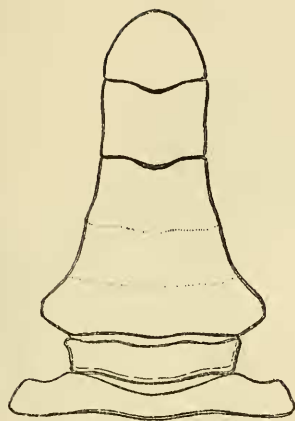


3 c

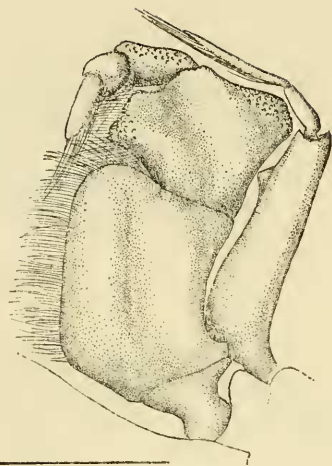
PLATE 6

Hexapanopeus cartagoensis, new species
Male holotype

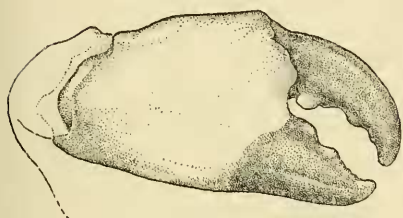
- Fig. 1. Dorsal view
- Fig. 2. Major chela
- Fig. 3. Abdomen
- Fig. 4. Left outer maxilliped



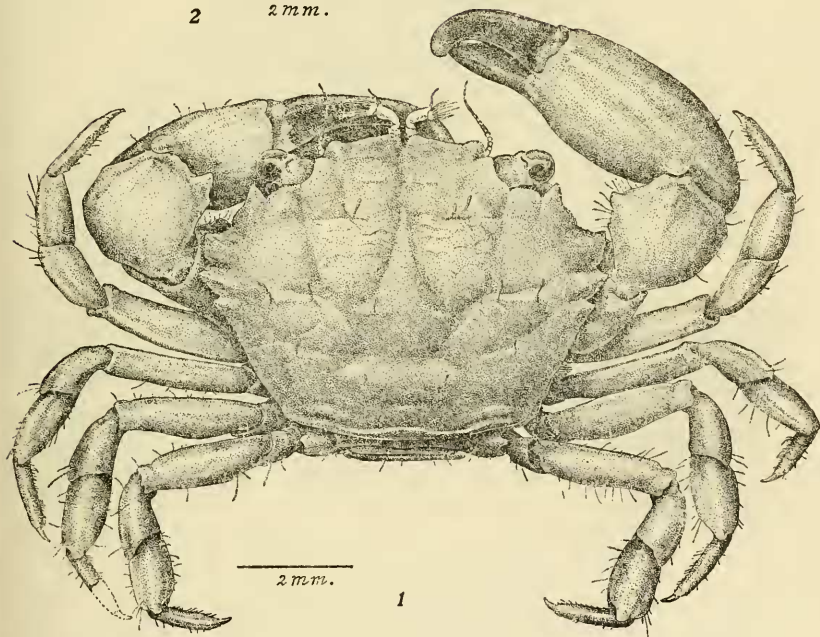
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1 m m. 4



2 2 m m.



2 m m. 1

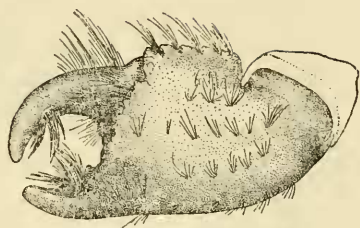
PLATE 7

Kraussia americana, new species
Male holotype

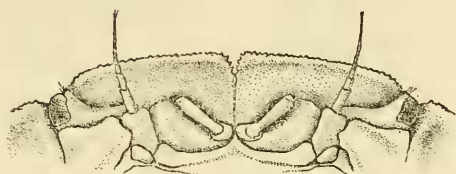
- Fig. 1. Dorsal view
- Fig. 2. Right outer maxilliped
- Fig. 3. Left chela
- Fig. 4. Ventral view of front



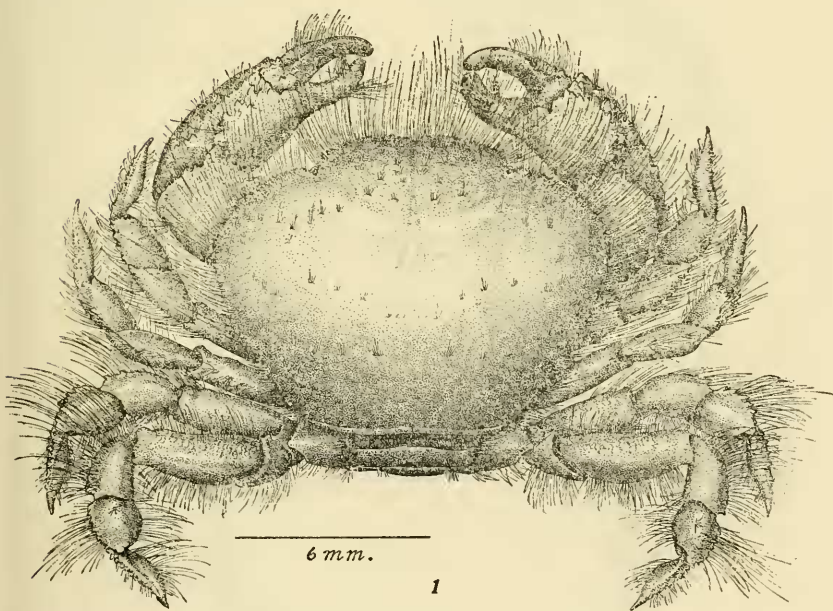
2 2 mm.



3 4 mm.



4 4 mm.



6 mm.

1

PLATE 8

Maldivia galapagensis, new species
Male holotype

- Fig. 1. Dorsal view
- Fig. 2. Right outer maxilliped
- Fig. 3. Minor chela
- Fig. 4. Chromatophores, anterior portion of carapace
- Fig. 5. Chromatophores, posterior portion of carapace
- Fig. 6. Dactyl of fourth ambulatory leg

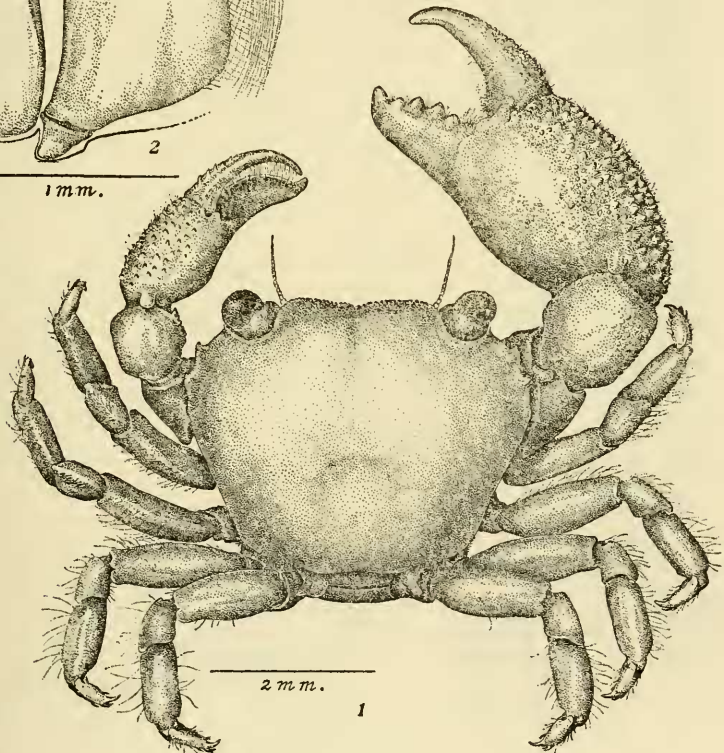
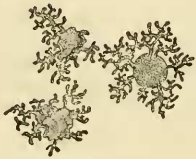
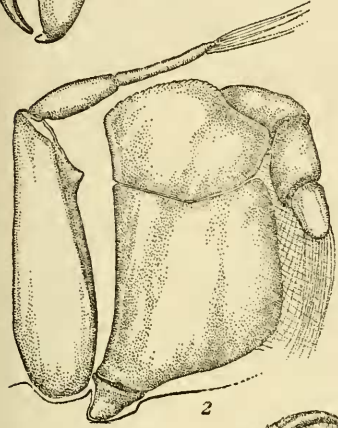
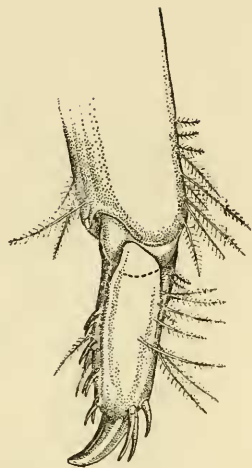
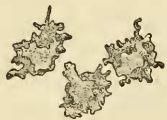
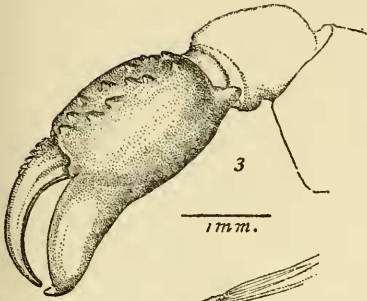


PLATE 9

Parapinnixa glasselli, new species
Female holotype

- Fig. 1. Dorsal view
- Fig. 2. Right outer maxilliped
- Fig. 3. Abdomen
- Fig. 4. Right chela

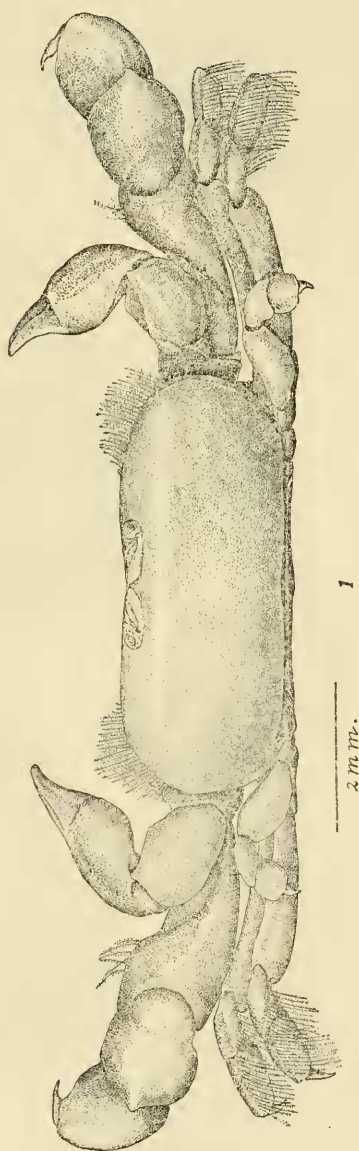
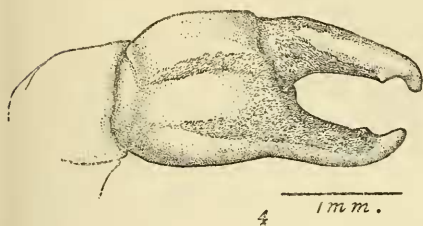
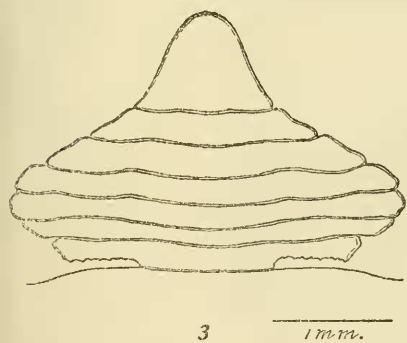
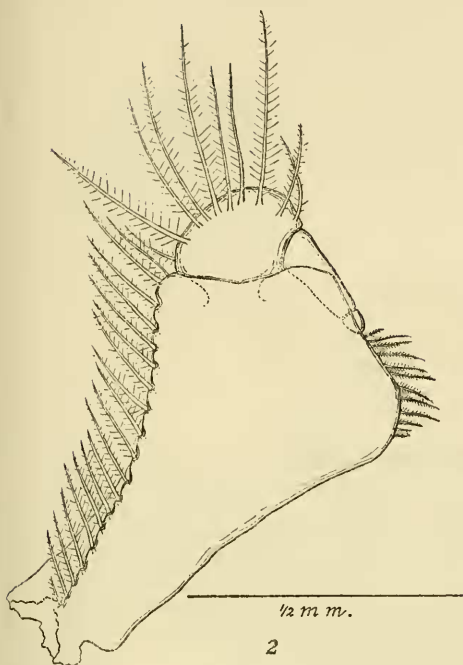


PLATE 10

Cymopolia velerae, new species
Female holotype

- Fig. 1. Dorsal view
- Fig. 2. Ventral view of orbit
- Fig. 3. Dorsal view of orbit
- Fig. 4. Right outer maxilliped

